Evaluation of Comments Filed by the Public Representative in Docket No. RM2020-2

Prof. Michael D. Bradley

Department of Economics

George Washington University

A. Introduction

In a set of comments filed in this proceeding, the Public Representative recommends complete rejection of all parts of the Postal Service's Proposal Ten, as well as the established methodology.[1] This recommendation is based primarily upon alleged bias in the use of Work Service Credits (WSCs) as the independent variable in the logistic variability equations presented in the Bradley Report. The alleged bias arises because of, in the Public Representative's view, perceived infirmities in WSCs as a measure of Postmaster workload, in combination with his mistaken understanding of the variability for which the logistic models are estimated. Once these misunderstandings are resolved, the basis for the Public Representative's concern disappears.

In addition, the Public Representative expresses concerns about the choice of the logistic model used to estimate the variabilities, and about a sensitivity analysis used to establish the robustness of the estimated variabilities. Again, these concerns arise from some confusion about the nature of logistic models and misunderstanding about how the sensitivity analysis works and what it shows.

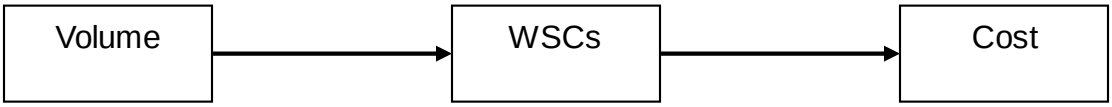
In the balance of this evaluation, the Public Representative's misapprehensions are presented and resolved. They include a misunderstanding of the Postal Service's approach to updating and refining the Postmaster variability, a misunderstanding of what WSCs are and how they should be calculated, a failure to account for the Commission's refinement and improvement of attributable costing methodologies since

[1] See, Public Representative Comments on Proposed Change in Analytical Principles Used in Periodic Reporting, Docket No. RM2020-2, February 28, 2020.

Docket No. R84-1, confusion about the bases for choosing among different logistic models, and an apparent misunderstanding of how a sensitivity analysis works and what the results show.

B. The Public Representative's Comments Reflect a Fundamental Misunderstanding of the Postal Service's Approach to Updating and Refining the Postmaster Variability.

Postmasters are compensated through the use of WSCs, in which their pay grade is determined by the number of credits earned. These credits are designed to capture the various activities that take place in a post office, including serving post office boxes and delivery routes, providing retail services, sorting mail, and performing administrative functions. When volume changes, some of these activities will change, resulting in a change in post offices' WSCs. This change in the post offices' WSCs can, in turn, lead to changes in pay for the affected Postmasters, and thus change overall Postmaster cost. This system means that the overall Postmaster variability has a two-part linkage between changes in volume and responses in costs. First, changes in volume affect WSCs, and second, changes in WSCs affect cost:



The established methodology estimates only the second of these two variabilities, implicitly assuming proportionality between volume and WSCs. Proposal Ten seeks to update and refine this second variability through use of an extensive

operational database and modern econometric techniques. This was made clear in the Postal Service's Proposal:[2]

> The current methodology for attributing Postmaster costs to products has been in place since Docket No. R84-1. It assumes proportionality between volume and WSCs, but relies upon a regression analysis presented in Docket No. R84-1 to measure the variability between WSCs and Postmaster costs.
>
> Given the time that has passed since the Docket No. R84-1 model was estimated, it seems appropriate to investigate if there have been any substantial changes to the Postmaster compensation system that would affect the relationship between WSCs and cost, and would affect the method through which the resulting variability should be estimated.

That the Postal Service followed this two-step approach should not come as a surprise, as this was the approach articulated and agreed to in the Commission's Strategic Rulemaking docket:[3]

> The Commission notes that the currently estimated volume variability for postmaster costs was presented in Docket No. R84-1, based upon a model estimated using data collected in FY 1978 and FY 1979. With that background, the Commission identifies the following set of research issues. First, the Commission suggested that the Postal Service should recalculate the variability of postmaster salaries with respect to Workload Service Credits (WSCs). It identifies this area as a near-term research priority. In addition, the Commission indicated the Postal Service should consider appropriate possible refinements to the equation used to estimate the variability of postmaster salaries. It identified this area as a medium-term research priority. Lastly, the Commission indicated it was interested in investigating the assumption that Work Service Credits vary in proportion to volume. This was identified as a long-term research priority.

[2] Docket No. RM2020-2, Proposal Ten, November 29, 2019 at 1.

[3] Postal Service Report Regarding Cost Studies: Response to PRC Order No. 1626, Docket No. RM2011-3, April 18, 2013 at 25.

Accordingly, Proposal Ten addresses the short-term and medium-term research priorities, but does not address the long-term research priority. That is, of the two variabilities identified in the diagram above, Proposal Ten does not investigate or attempt to estimate the first variability, but rather focuses on the steps necessary to update and refine the second variability.

This two-step approach is well established in Commission practice, as in the case of purchased highway transportation. First, the Commission and the Postal Service worked to update and refine the "second" variability, the variability between changes in capacity and responses in cost.[4] Only after that variability was updated and refined did the Commission and the Postal Service work to estimate the "first" variability capturing the impact of changes in volume on capacity.[5] The Postal Service is simply following this established procedure by updating and refining the variability of cost with respect to WSCs before investigating the possibilities of estimating a variability of WSCs with respect to volume.

In sum, the Commission has recommended and the Postal Service has followed the two step-procedure for updating and refining the Postmaster variability:[6]

> The Commission and the Postal Service agree that recalculating the volume variability of postmaster costs based on current postmaster salaries and Workload Service Credit data is a task that should be pursued in the near term.

[4] See, Dockets R87-1, R97-1, R2000-1, and RM2014-6, Proposal Six.

[5] The Commission first suggested a method for estimating this variability in Docket No. N2010-1. The Postal Service adopted and refined the Commission's method in Docket No. RM2016-12, Proposal Four. The Commission approved the refined method in that docket.

[6] Postal Regulatory Commission, Order No. 1626, Docket No. RM2011-3 January 18, 2013 at 8.

> The costs of doing so appear to be relatively small, since the data is available from regular reports compiled for management purposes.
>
> The benefits of rerunning the established model using current data are potentially large. In FY 2012, the Postal Service incurred $2.2 billion in accrued postmaster salaries. The current volume variability estimate relies on data that are more than 30 years old. Recalculating that variability under the current method using current data, therefore, is highly likely to improve the accuracy of the result. Therefore, the Postal Service should include recalculation of the volume variability of postmaster costs in its near-term research agenda.
>
> The Postal Service notes that the regression model of postmaster cost variability itself might benefit from further refinement. It also notes that the assumption that Work Service Credits vary in proportion to volume would benefit from more rigorous examination. The Commission agrees, but regards these tasks as suitable for pursuing in the medium term, and long term, respectively.

The Public Representative's Comments mischaracterize the Postal Service effort to update the WSC-to-cost variability as an attempt to estimate a volume-to-cost or workload-to-cost variability, as if it were attempting to estimate both variabilities at the same time. This misunderstanding leads the Public Representative to make ill-founded assertions about the use of WSCs in the logistic equations that relate the Postmaster's pay grade to the level of WSCs.

Contrary to the Pubic Representative's assertion that the independent variable in the logistic regressions contains measurement error, and thus imparts bias in the estimated coefficients, WSCs accurately measure the basis for setting Postmaster compensation. Minimum salaries for each EAS grade are determined on the basis of WSCs, and the data used for the variability regressions are taken directly from the

electronic database that the Postal Service actually uses to determine each post office's pay grade. The logistic equations are designed to estimate how Postmaster pay grades (and thus costs) respond to changes in calculated workload. WSCs are the calculated workload measures used to determine paygrades and are thus the appropriate variable to include in the equations. Moreover, because they are used in pay determination, WSCs are very accurate measures of the relevant workload and do not suffer from the measurement error about which the Public Representative is concerned. Without measurement error in the independent variable, the associated coefficient is not biased, so the primary concern raised in the Public Representative's Comments about the logistic equations does not exist.

C. The Public Representative's Comments Reflect a Misunderstanding Regarding What WSCs Are and How They Are Used.

The Public Representative's Comments review the original development of the WSCs, describing the identification of various workload factors (such as the number of post office boxes served or gross revenue) and the determination of the values that the Postal Service operations experts assigned to each one.[7] After this description, the Public Representative makes the following curious statement:[8]

> Accordingly, using weights to combine the 14 workload and revenue factors into a single index number for each post office severed the direct link between workload factors and the determination of WSC's.

[7] See, Public Representative Comments on Proposed Change in Analytical Principles Used in Periodic Reporting, Docket No. RM2020-2, February 28, 2020, at V-12.

[8] Id.

This statement is curious because it flies in the face of the appropriate and standard method of calculating workload -- weighting the various factors by their workload content. For example, this weighting is done by the Postal Service in calculating its Total Factor Productivity, a process another Public Representative has described:[9]

> The workload plays an important role in measuring the output or the TFP index. For example, to develop a measure of volume (i.e. weighted mail volume measure), the Postal Service weights each mail type "according to its workload content." The workload itself is comprised of multiple factors (weight, size, mode of transportation etc.). [Internal citation omitted]

The logic behind weighting workload factors is clear. If a certain activity takes more time or effort, then it should be given a larger weight in calculating workload. Simply adding together, unweighted, different activities can produce a very misleading measure. For example, although they have the same unweighted workload factors (1,700 pieces), a carrier who delivers 1,200 DPS letters and 500 flats has a very different workload than a carrier who delivers 1,200 parcels and 500 flats. This logic is why the rural carrier compensation system applies weights (called the "evaluation standards") to the various activities performed by a rural carrier in order to calculate the

[9] See, Declaration of Lyudmila Y. Bzhilyanskaya For the Public Representative, Docket No. RM2017-3, March 20, 2017, at 4. For an academic reference on the appropriateness of using a weighted output measure, see "Bradley, Michael D, and Baron, D.M., "Measuring Performance of a Multiproduct Firm: An Application to the U.S. Postal System," Operations Research, Vol 41. No 3. June 1993.

routes total workload or "evaluated time."[10] This evaluated time is then used to determine the type of route and, ultimately, the rural carriers' compensation.[11]

> This component contains the labor costs associated with evaluated routes. On an evaluated route, a rural carrier is paid based on the evaluated time for the route. The evaluated time is developed based on compensation categories for various carrier activities such as route length, boxes served as well as the volume by type delivered and collected.

Moreover, the rural carrier evaluation standards have been developed in a number of different ways, including time measurement, negotiation, and expert opinion. The parallels between the rural carrier system and the Postmaster WSC system are clear, illustrating that the Public Representative's criticisms of the WSC system are unfounded. In fact, the Public Representative's Comments have it exactly backwards:[12]

> More importantly, by prioritizing factors (i.e. by establishing their weights) the ECPS predetermined much of the causal relation between the combined workload factors to WSCs, making WSCs a faulty measure of postmaster workload and variability in response to workload changes.

Contrary to this statement, the assignment of weights is entirely appropriate, and it is very reasonably within the Postal Service's discretion to determine what relative values it wants to put on various Postmaster activities.

---

[10] Rule 39 C.F.R. Section 3050.60(f) Report for FY 2018 (Summary Descriptions), July 1, 2019, file "CS10-18.docx," at 10-2.

[11] Rule 39 C.F.R. Section 3050.60(f) Report for FY 2018 (Summary Descriptions), July 1, 2019, file "CS10-18.docx," at 10-2.

[12] See, Public Representative Comments on Proposed Change in Analytical Principles Used in Periodic Reporting, Docket No. RM2020-2, February 28, 2020 at V-12.

The Public Representative may take issue with the workload factors derived and used by Postal Service operations experts, and may wish to design his own Postmaster compensation system, but none of that is relevant for determining the variability of Postmaster cost with respect to changes in WSCs. For example, the Public Representative's Comments suggest that he prefers the use of a dim-weighted measure of mail handled instead of revenue in determining WSCs.[13] But the merit, or lack thereof, of this approach does not alter the fact that, in the current compensation system, revenue is used to determine WSCs and Postmaster compensation.

The Public Representative's preference for a different system does not change the fact that, in actuality, WSCs do indeed provide the basis on which Postmasters' EAS grades and compensation are set. The Public Representative's Comments fail to acknowledge this point, because they criticize the Bradley Report for not modifying the weights used in the WSC system. But such a modification would be inappropriate, because these weights are used as part of the compensation system. Accurate attribution of costs to products depends upon reflecting the actual basis of cost incurrence, not an artificial basis constructed by the analyst.

The lack of foundation for the Public Representative's claims about inaccuracy in WSCs is further illustrated by the attempt in his Comments to deny the fact that WSCs are operational data, on the basis that they instead relate to what is described as "human resource purposes:"[14]

---

[13] See, Public Representative Comments on Proposed Change in Analytical Principles Used in Periodic Reporting, Docket No. RM2020-2, February 28, 2020 at V-15, Footnote 22.

[14] Id at VII-1.

> The fundamental problem with the Bradley Report is that it used data meant for human resource purposes, not operational purposes.

The term "human resource purposes" is not defined in the comments, and the sole basis for asserting that WSCs serve this purpose is the fact that the WSC factors were determined by a task force and later refined by an "unnamed" Postal Service department.[15] But the fact that some data might be used for human resource purposes does not disqualify those data from being operations data. In fact, a primary use of operations data is to manage employees and their associated costs. Letter carriers Form 3999 data are used to manage city carrier routes, which is presumably a human resource purpose, but they are clearly operational data. Similarly, the recorded hours for SPR carriers are used to determine both carrier compensation and workload, clearly human resource functions, but they are acknowledged as operational data.

D. The Public Representative's Comments Fail to Account for the Commission's Refinement of Attributable Costing Methodologies Over the Last Thirty Years.

The Public Representative's Comments appear to exhibit unfamiliarity with the advances in attributable costing methodology that have taken place through both traditional rate cases and, more recently, Commission rulemakings. As computing power, econometric methods, and electronic data collection techniques have improved,

[15] Id. The Public Representative alleges that the use of WSCs for human resource purposes, in itself, leads to measurement error and non-sampling error. But this assertion is without any foundation. The subsequent use of data does not determine whether the data were was measured with error. Moreover, the Public Representative does not explain what sampling has to do with the calculation of WSCs. There is no sampling, as the data set includes observations on all relevant post offices, and inputs into the WSC calculation are known with certainty, not sampled.

the Commission's methodologies have evolved and likewise improved. A methodology useful for a past period of time that featured limited data availability and computing power is not likely to be appropriate for current times. Instead of recognizing this important development, the Public Representative appears to be suggesting for Postmaster costs a return to functional analysis, a method of analysis that was applicable in the late 1970s and early 1980s.[16]

A functional analysis proceeds by taking a particular postal activity, like city carrier street delivery, and breaking it into smaller, perhaps artificial, divisions that can be more readily investigated with field studies. For example, in the early 1980s, the Postal Service pursued a functional analysis of city carrier street time, in which street time was broken down into Route Time, Access Time, Elemental Load Time, Coverage-Related Load Time and Street Support:[17]

> In the Docket No. R84-1 proceeding, the Commission adopted the functional breakdown of street time costs proposed by the Postal Service with some modifications. The … total accrued costs [are split] into the five primary functional areas ….

[16] For example, on page VII-1 of the Public Representative's Comments, it states:

> [A]n appropriate model would need to identify distinct and non-overlapping activities which drive workload or worktime. It is possible that a close examination of the quantitative indicators of activity could be tested to identify a set of distinct and non-overlapping activities which driver workload.

[17] Postal Rate Commission, Opinion and Recommended Decision, Docket No. R87-1 at 219.

The individual "functions" were then studied with a menu of field studies including the Street Time Sampling (STS) study, the Curbline and Foot Access Tests (CAT/FAT) and the Load Time Variability (LTV) study. Because field studies are expensive and time consuming, they typically produce relatively small data sets, are performed at different points in time, and produce differently structured data sets. As the Commission recognized, this creates difficulty in accurately putting the individual pieces back together to calculate an overall variability. However, as electronic data collection systems developed, along with dramatic increases in computing power and more sophisticated empirical methods, it became possible to simultaneously analyze all of the activities that comprise city carrier street time:[18]

> The Commission agrees that the dependence of the established analysis on separate STS, CAT/FAT and LTV samples, which were all collected at different times using different sample frames and sampling methods, is a source of imprecision in its variable street time estimates that the CCSTS data does not share. Witness Bradley correctly observes that integrating the results of these studies that employ data and variable definitions that are not entirely compatible makes it difficult to econometrically model street time variability. The comprehensive nature of the CCSTS dataset, and the generally consistent definition of its major variables, give the Bradley study an advantage over the established analysis. This supports the Commission's conclusion that it is likely to more accurately reflect current street time variability.

Given the availability of an electronic data set that covers all post offices in the EAS system and econometric techniques that support capturing the actual relationship between WSCs and Postmaster costs, there is no need to return to older methods of

[18] Postal Rate Commission, Opinion and Recommended Decision, Docket No. R2005-1, November 1, 2005, at 64.

attribution analysis. Moreover, if there were to be a place for a version of a functional analysis, it would be in analyzing the relationship between volume and WSCs, not in evaluating the variability between WSCs and cost as is done in Proposal Ten.

E. The Public Representative's Comments Misstate the Factors for Choosing between Dichotomous and Polychotomous Logistic Models.

In reviewing the econometric analysis presented in the Bradley Report, the Public Representative questions the choice of estimating a series of dichotomous logistic models instead of estimating a single polychotomous logistic model in which the dependent variable takes on more than two values. In particular, the Public Representative's Comments take issue with the justification for the choice presented in the Bradley Report, namely, that the individual dichotomous logit models have different estimated regression parameters, thereby violating the assumption of the relevant polychotomous model that the regression parameters are the same across all pairs of the dependent variable.[19] The Public Representative argues that a book about categorical data analyses suggests that a polychotomous logistic model can be estimated with different estimated parameters for different dichotomous groupings of the dependent variable.

Unfortunately, the Public Representative's Comments reflect a basic confusion about polychotomous logistic models, which is apparently what led to the erroneous assertion that the set of dichotomous Postmaster logistic models should necessarily be replaced with a single polychotomous model. It turns out that the type of

[19] See, O'Connell, Ann A., Logistic Regression Models for Ordinal Response Variables, SAGE Publications, Inc, 2006, at 31.

polychotomous logistic model that should be estimated depends upon whether the dependent variable in the regression is a nominal variable or an ordinal variable. In this context, a nominal variable is one for which there is no inherent ordering of the different values for the dependent variable. For example, if a polychotomous logistic model was being used to predict whether consumers would buy vanilla, chocolate, or strawberry ice cream, the dependent variable would be nominal because there is no inherent ordering of the dependent variable. On the other hand, if the dependent variable in a logistic regression was the number of years of schooling completed or the level of degree earned, then it would be ordinal because there is an unambiguous ranking of the values from low to high.

When the dependent variable in a polychotomous logistic model is nominal, then a multinomial logit model (also called a "baseline model," as it is in the Agresti book cited by the Public Representative) should be used. In contrast, when the dependent variable is ordinal, then the relevant polychotomous logistic model is the proportional odds model (also called the "cumulative logit model," as in the Agresti book). In the case of the Postmaster variability equation, the dependent variable is ordinal, because the EAS grades are sequential from the lowest value to the highest value, and thus have an inherent order in which compensation increases monotonically with EAS grade.

In the proportional odds or cumulative logit models, a different intercept is estimated for each value of the dependent variable, but only a single coefficient is estimated for each explanatory variable.[20] For the Postmaster variability equation, the

[20] See, Agresti, Alan, An Introduction to Categorical Data Analysis, 3rd ed., John Wiley and Sons, Hoboken, NJ, 2019, at 168 (Equation 6.4).

polychotomous logistic model would thus assume that there is a single speed of adjustment in EAS grades to a change in WSCs across all EAS grades. But as explained in the Bradley Report, that assumption does not hold because of the nature of the EAS grade structure, in which larger increases in WSCs are required to move up a grade as the Postmaster's grade level increases. That the assumption does not hold can also be seen by examining the estimated transition coefficients from the individual logistic regressions:[21]

> A reasonable strategy for investigating whether the effects of the independent variables are relatively stable or not across the cumulative logits is through comparison of variable effects across the separate logistic regression models that correspond to the ordinal model being considered, as in Table 4.1. Although the simplifying assumption of proportionality may be useful in terms of fitting an overall model to the data, it has been recommended that researchers examine the underlying binary models in order to supplement decisions about the aptness of an ordinal approach (Brant, 1990; Clogg & Shihadeh, 1994; Long, 1997; O'Connell, 2000)

Table 1 presents those coefficients, which are taken from the Bradley Report:[22]

[21] See, O'Connell, Ann A., Logistic Regression Models for Ordinal Response Variables, SAGE Publications, Inc, 2006, at 30.

[22] See Bradley Report: Table 14 (page 29), Table 16 (page 34), and Table 18 (page 36).

Table 1

Estimated Transition Coefficients from Logistic Models

EAS Grades	Coefficient	Std. Error	Wald Chi-Square
18 to 18B	0.0675	0.00660	106.2
18B to 20	0.00757	0.000425	317.7699
20 to 21	0.00349	0.000287	148.1936
21 to 22	0.00184	0.000193	91.0048
22 to 24	0.000544	0.000079	47.6234
24 to 26	0.000394	0.000132	8.88

Table 1 makes it abundantly clear that the various EAS steps do not have the same transition coefficient, invalidating the assumption of the polychotomous logistic model. Finally, one can perform a statistical test for the equality of the estimated coefficients.[23] Table 2 shows the results of that test, indicating a strong rejection of the assumption.[24]

Table 2

Chi-Square Test for the Proportional Odds Assumption

Chi-Square	DF	Pr > ChiSq
4294.2259	5	<.0001

[23] The SAS program that performs this test and the output from running that program are provided in the Appendix to this report.

[24] If a lack of efficiency is a material problem in estimating the individual dichotomous regression parameters, there are other polychotomous approaches, such as a partial proportional odds ratio model or abandoning the information contained in the ordering, that could be applied. However, as explained, infra, a lack of efficiency is not a material problem for the dichotomous regression models, so these alternative approaches are not needed.

The Public Representative's Comments also raise the issue of the relative efficiency of a polychotomous logistic model versus a series of dichotomous models, indicating that, theoretically, the polychotomous model will be more efficient. But the Public Representative's Comments do not address the implications of relative inefficiency and do not provide any indication of how serious this potential problem is for the Postmaster variability equations. Doing so reveals that inefficiency is not a material difficulty for the dichotomous logit models.

A less efficient estimator will have larger standard errors for the estimated coefficients than a more efficient estimator. The cost of inefficiency is thus the possibility of performing statistical inference with inflated standard errors.

But, examination of Table 1 shows that this is not a problem for the Postmaster logistic regressions, as the standard errors from the dichotomous regressions are very small. In all cases, the standard errors are small enough to support rejection of the null hypothesis of a zero coefficient, so reducing the size of the standard errors beyond those produced by the dichotomous logistic regressions would not affect the hypothesis testing. In other words, a lack of efficiency is not a material problem for the dichotomous logistic regressions estimated in the Bradley study.

F. The Public Representative's Description of the Sensitivity Analysis in the Bradley Report is Erroneous and the Comments Misstate the Results of that Analysis.

In order to demonstrate that the logistic variability equations produce very similar variabilities for both relatively low and relatively high WSC growth rates, the Bradley report presents a sensitivity analysis in which variabilities are calculated over a

reasonable range of WCS changes. That analysis shows the estimated variabilities are indeed robust and are thus applicable to a wide range of different WSC changes. This means that the choice of the benchmark WSC change is not critical, because the resulting attributable cost will be quite similar for any reasonable choice.

The Public Representative takes issue with this approach and puts forth two concerns about the analysis, neither of which bears scrutiny.[25] First, the Public Representative's Comments state:[26]

> The Bradley Report justifies presents cost weighted averaging as a method of determining the "overall potential" impact of different WSC growth rates (θ). *Id., 44.* It doesn't determine the overall potential impact in general, but chooses the test growth rate of 7.0 percent because this is the rate at which the impact of a test growth rate in WSC's (θ) produces a stable variability estimate.

[25] As an additional matter, in describing the elasticity calculation algorithm, the Public Representative's Comments (at page V-17) makes the following unfounded statement:

> The Bradley Report assumes that something is wrong if its chosen model does not produce a variability estimate similar to Wang's model. It does not consider the possibility that its model could show there was no significant volume variability.

Nowhere in the Bradley Report is this assumption stated or implied. Not only does the report reduce the Wang variability by correcting the computational formula, it produces estimated variabilities that are well below the 18.23 percent presented in witness Wang's testimony. Moreover, the possibility that the models would produce extremely low variabilities was not only considered, but has been addressed (Response of the United States Postal Service to Chairman's Information Request No. 2, Question 6, January 29, 2020):

> When the WSC change is very small, there will be no change in postmaster grades and salaries as a result of that very small WSC change, leading to a variability of zero.

[26] See, Public Representative Comments on Proposed Change in Analytical Principles Used in Periodic Reporting, Docket No. RM2020-2, February 28, 2020 at V-18.

The meaning of this statement is unclear. While it is true the Bradley Report produces an overall, cost-weighted variability as a convenient way of summarizing the many variabilities produced in the sensitivity analysis, it is simply wrong to state that the analysis "chooses the test growth rate of 7.0 percent because this is the rate at which the impact of a test growth rate in WSC's (θ) produces a stable variability estimate." First of all, the sensitivity analysis does not include a 7 percent growth test growth rate as cited by the Public Representative, so such a growth rate could not have been selected. Second, no single test growth rate was selected.[27] The point of a sensitivity analysis is to calculate variabilities for different growth rates, so a single test growth rate would not be selected. The stability of the estimated variabilities is an outcome of the sensitivity analysis, not an input choice.

In raising the second concern, the Public Representative's Comments state:[28]

---

[27] The Public Representative seems to be confused about the sensitivity analysis on two levels here. First, the following quotation suggests a confusion between the WSC growth rates and the associated variabilities (Public Representative Comments at V-19):

> It's one thing to claim to choose a test case WSC growth rate (θ) where the resulting variability levels are relatively stable, and another matter to both claim that 7 percent is that level and that 10 percent is the appropriate matching variability.

In actuality, the growth rate (θ) is 10 percent and the resulting variability is 7 percent. Second, The Public Representative misunderstands the sequence of these events in the sensitivity analysis, claiming that the sensitivity analysis is used to determine what the benchmark WSC change should be, based on some predetermined variability. Just the opposite is true. The sensitivity analysis treats the initial benchmark as a test case and is designed to see how much it matters if a different growth rate is chosen.

[28] See, Public Representative Comments on Proposed Change in Analytical Principles Used in Periodic Reporting, Docket No. RM2020-2, February 28, 2020 at V-19.

> Secondly, using cost-weighted variabilities to choose the appropriate test case percent changes in WSCs (θ) will tend to blend the results together. Similarly, the Bradley Report does not explain why it limited test case changes in WSCs to a low value of 2.5 percent and a high value of 20 percent.

Again, the meaning of this statement is not clear, as the Public Representative does not define what is meant by the term "blended" or demonstrate mathematically that "blending" would occur. However, the use of cost-weighted individual variabilities to produce an overall variability is well established within the Commission's attributable costing methodology. This approach, for example, has been followed in purchased highway transportation to combine sub-account variabilities into an overall account level variability and was again approved by the Commission in a recent rulemaking.[29] Moreover, as explained in the Bradley Report, the cost-weighted variability is used solely for illustration, as the individual EAS-grade variabilities are used for calculating attributable costs. Therefore, the concern about "blending" is misplaced.

The Public Representative also takes issue with the range of WSC changes included in the sensitivity analysis, failing to understand that the point of a sensitivity analysis is to examine a range of conditions that encompass likely possible outcomes. Thus, the lower boundary of the sensitivity analysis is in the range of average annual growth rates for WSCs, while the upper boundaries reflect WSC growth rates over multiple years. This contrasts with the Public Representative's approach to a sensitivity analysis, which include values well beyond the realm of possibility. Given the history of

[29] See, Technical Appendix, in USPS-RM2014-6/1, Docket No. RM2014-6 (June 20, 2014), and A New Study of Special Purpose Route Carrier Costs, Docket No. RM2019-6 (June 21, 2019) at 79.

Postmaster activity, it is simply not sensible to investigate WSC increases of 30 to 99 percent. Recent history, as presented in Table 3, shows that even multi-year growth rates are nowhere near that high.

Table 3
Three Year Growth in WSC By EAS Grade

Grade	2015 to 2018	2016 to 2019
EAS-18	-2.3%	-0.5%
EAS-20	0.6%	0.4%
EAS-21	3.6%	1.0%
EAS-22	4.6%	3.5%
EAS-24	4.9%	2.2%

Yet, even at the extreme values chosen by the Public Representative, the resulting variabilities are remarkably stable, with very little variation in the estimated variabilities for WSC changes greater than 30 percent.

G. Conclusion

The Public Representative's Comments argue that both the established method for calculating a variability for Postmasters and the Postal Service's proposal to update and refine the variability calculation suffer from fatal flaws. This remarkably strong assertion is based upon the erroneous assumption that, for the purpose of determining Postmaster compensation, WSCs are flawed measures of workload. This assumption

is demonstrably false, because WSCs have been used by the Postal Service as the measure that sets Postmaster salary grades.

Elimination of this erroneous assumption removes the Public Representative's claim that use of WSCs in the logistic regressions leads to biased coefficient estimates, and thus eliminates the entire basis for the claim that Proposal Ten should be rejected.

APPENDIX

TESTING THE ASSUMPTION OF COMMON SLOPE COEFFICIENTS

A. SAS Program

```
ods graphics off;
options nodate;
options nonumber;

libname PM 'D:\Documents\Postmasters 2019';


*********************************************;
*** Read in Form 150 Data  ******************;
*********************************************;


data wSc1; set  PM.apr_credits;

** Create Numerical EAS Grades   *************;

data wsc1;  set wsc1;
if    Grade =     'EAS-18'    then  EASG  =     1     ;
if    Grade =     'EAS-43'    then  EASG  =     2     ;
if    Grade =     'EAS-20'    then  EASG  =     3     ;
if    Grade =     'EAS-21'    then  EASG  =     4     ;
if    Grade =     'EAS-22'    then  EASG  =     5     ;
if    Grade =     'EAS-24'    then  EASG  =     6     ;
if    Grade =     'EAS-26'    then  EASG  =     7     ;

****  Incorporate Minimum Salaries For Each EAS Grade ****;
data wsc1; set wsc1;
if grade = 'EAS-18' then minsal = 54081;
if grade = 'EAS-43' then minsal = 59300;
if grade = 'EAS-20' then minsal = 65300;
if grade = 'EAS-21' then minsal = 71000;
if grade = 'EAS-22' then minsal = 73300;
if grade = 'EAS-24' then minsal = 82000;
if grade = 'EAS-26' then minsal = 99900;

run;
****  Select Model to Be Estimated ****;

data wsc2;  set wsc1;

data wsc2; set wsc2;

data wsc2; set wsc2;
if wsc = '.' then delete;

run;
************* Estimate Cumulative Logit Model   ************;

PROC LOGISTIC descending outest=lgco;
```

```
   CLASS EASG  ;
      MODEL EASG  = WSC / rsq     ;;
      output out=lp1 predicted =pprob xbeta =prgrd predprobs=individual
;
run;
```

B. Program Results

The SAS System

The LOGISTIC Procedure

Model Information

Data Set	WORK.WSC2
Response Variable	EASG
Number of Response Levels	7
Model	cumulative logit
Optimization Technique	Fisher's scoring

Number of Observations Read	13611
Number of Observations Used	13611

Response Profile

Ordered Value	EASG	Total Frequency
1	7	64
2	6	257
3	5	858
4	4	1170
5	3	2614
6	2	4535
7	1	4113

Probabilities modeled are cumulated over the lower Ordered Values.

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Score Test for the Proportional Odds Assumption

Chi-Square	DF	Pr > ChiSq
4294.2259	5	<.0001

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	41662.402	5068.454
SC	41707.513	5121.084
-2 Log L	41650.402	5054.454

The SAS System

The LOGISTIC Procedure

R-Square 0.9320 Max-rescaled R-Square 0.9779

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	36595.9478	1	<.0001
Score	3787.0977	1	<.0001
Wald	2420.8267	1	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept 7	1	-663.7	14.3428	2141.0620	<.0001
Intercept 6	1	-282.0	5.7723	2387.1931	<.0001
Intercept 5	1	-106.1	2.1747	2379.9937	<.0001
Intercept 4	1	-53.5164	1.0930	2397.1524	<.0001
Intercept 3	1	-22.2758	0.4551	2396.0159	<.0001
Intercept 2	1	-8.5553	0.1764	2352.2680	<.0001
WSC	1	0.00410	0.000083	2420.8267	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
WSC	1.004	1.004	1.004

Association of Predicted Probabilities and Observed Responses

Percent Concordant	99.8	Somers' D	0.997
Percent Discordant	0.1	Gamma	0.997
Percent Tied	0.0	Tau-a	0.747
Pairs	69384061	c	0.998